

## CLAIMS

1. An electric resistance type detecting sensor characterized in that a pair of electrodes is provided oppositely to each other on the surface of an electrically insulated substrate, and a film of electroconductive fine particles modified with a probe is formed on and/or between the electrodes.
2. An electric resistance type detecting sensor characterized in that a recess is provided on the surface of an electrically insulated substrate, a pair of electrodes is provided oppositely to each other on the recess and a film of electroconductive fine particles modified with a probe is formed on and/or between the electrodes.
3. The electric resistance type detecting sensor according to claim 1 or 2, wherein the film of electroconductive fine particles comprises a binder.
4. The electric resistance type detecting sensor according to any one of claims 1 to 3, wherein the probe is DNA or an antibody.
5. The electric resistance type detecting sensor according to any one of claims 1 to 4, wherein the electroconductive fine particles are gold nano-particles.

6. The electric resistance type detecting sensor according to claim 5, wherein the binder is 1,10-decanedithiol.
7. The electric resistance type detecting sensor according to claim 5 or 6, wherein the DNA or antibody is activated with SH or NH<sub>2</sub> group.
8. The electric resistance type detecting sensor according to any one of claims 5 to 7, wherein at least one end of the DNA or antibody is activated with SH or NH<sub>2</sub> group.
9. The electric resistance type detecting sensor according to any one of claims 5 to 8, wherein both ends of the DNA or antibody are activated with SH or NH<sub>2</sub> group.
10. An electric resistance type detecting sensor characterized in that it comprises a substrate having two or more fine recesses formed on the surface thereof; a film of electroconductive fine particles formed on the inner surface of the respective recesses; and first and second electrodes formed so as to be electrically connected to the film of electroconductive fine particles,  
wherein the film of electroconductive fine particles is modified with a probe.
11. An electric resistance type detecting sensor characterized in that

it comprises a substrate having two or more fine recesses formed on the surface thereof; a film of electroconductive fine particles formed on the inner surface of the respective recesses; and first and second electrodes formed so as to be electrically connected to the film of electroconductive fine particles,

wherein the first electrodes are formed on the surface of the substrate and the second electrodes are formed on the inside of the recesses and

the film of electroconductive fine particles is modified with a probe.

12. The electric resistance type detecting sensor according to claim 10 or 11, wherein either of the first or second electrodes are electrically connected to each other.

13. The electric resistance type detecting sensor according to claim 11, wherein two or more recesses are arranged in matrix formed from a plurality of rows and columns, and the first electrode in respective rows and the second electrode in respective columns are electrically connected to each other, respectively.

14. The electric resistance type detecting sensor according to any one of claims 10 to 13, wherein the recesses are in the form of cone.

15. The electric resistance type detecting sensor according to any one

of claims 10 to 14, wherein the film of electroconductive fine particles comprises a binder.

16. The electric resistance type detecting sensor according to any one of claims 10 to 15, wherein the probe is DNA or an antibody.

17. The electric resistance type detecting sensor according to any one of claims 10 to 16, wherein the electroconductive fine particles are gold nano-particles.

18. The electric resistance type detecting sensor according to claim 17, wherein the binder is 1,10-decanedithiol.

19. The electric resistance type detecting sensor according to claim 17 or 18, wherein the DNA or antibody is activated with SH or NH<sub>2</sub> group.

20. The electric resistance type detecting sensor according to any one of claims 17 to 19, wherein at least one end of the DNA or antibody is activated with SH or NH<sub>2</sub> group.

21. The electric resistance type detecting sensor according to any one of claims 17 to 20, wherein both ends of the DNA or antibody are activated with SH or NH<sub>2</sub> group.

22. An electric resistance type detecting method of detecting the presence of a target substance which reacts with a probe, comprising:

modifying, with the probe, a film of electroconductive fine particles formed on the surface of an electrically insulated substrate;

applying a test sample including a substance to be detected to the modified film; and

measuring an electric resistance value between two points of the film of electroconductive fine particles.

23. An electric resistance type detecting method of detecting the presence of a target substance which reacts with a probe, comprising:

preparing, in advance, a test sample containing a substance to be detected and the probe;

applying the test sample onto a film of electroconductive fine particles formed on the surface of an electrically insulated substrate; and

measuring an electric resistance value between two points of the film of electroconductive fine particles.

24. The electric resistance type detecting method according to claim 22 or 23, wherein the probe is DNA or an antibody.